

*Accuracy order in L2 grammatical morphemes:  
Corpus evidence from different proficiency levels  
of Turkish learners of English*

Erdem Akbaş

Erciyes University, Kayseri, Turkey

<https://orcid.org/0000-0003-2204-3119>

[erdemakbas@erciyes.edu.tr](mailto:erdemakbas@erciyes.edu.tr)

Zeynep Ölçü Dinçer

Hakkari University, Turkey

<https://orcid.org/0000-0002-3680-3986>

[zeynepdincer@hakkari.edu.tr](mailto:zeynepdincer@hakkari.edu.tr)

Abstract

The present study empirically scrutinizes the fixed natural order of grammatical morphemes relying on a manual analysis of an EFL learner corpus. Specifically, we test whether the accuracy order of L2 grammatical morphemes in the case of L1 Turkish speakers of English deviates from Krashen's (1977) natural order and whether proficiency levels play a role in the order of acquisition of these morphemes. With this in mind, we focus on the (in)accuracy of nine English grammatical morphemes with 2883 cases manually tagged by the UAM Corpus Tool in the written exam scripts of Turkish learners of English. The results based on target-like use scores provide evidence for deviation from what is widely believed to be a set order of acquisition of these grammatical morphemes by second language learners. In light of such findings, we challenge the view that the internally driven processes of mastering grammatical morphemes in English for interlanguage users are largely independent of their L1. Regardless of L2 grammar proficiency in our data, the observed accuracy of some morphemes ranked low in comparison with the so-called natural order. These grammatical morphemes were almost exclusively non-existent features in participants' mother

tongue (e.g., third person singular *-s*, articles and the irregular past tense forms), thus suggesting the influence of L1 in this respect.

*Keywords:* grammatical morpheme; second language acquisition; natural order; learner corpus; English as a foreign language

## 1. Introduction

The focus of second language acquisition (SLA) research involves scrutinizing and gaining an understanding of the development of learners' linguistic competence in the target language (TL). As stated by Goldschneider and DeKeyser (2001), researchers also strive to establish how similar these processes are in the first and second language (L1 and L2, respectively). Exploring the developing interlanguage systems with respect to grammatical morphemes (such as *-s* added to nouns to mark plurality or *-ing* added to the main verb to mark the progressive aspect), morpheme order studies have received considerable attention from SLA specialists (Goldschneider & DeKeyser, 2001; Luk & Shirai, 2009). Even though there has been a body of research supporting the assumption that L2 grammatical morpheme acquisition in English by different L1 learners is bound to a universal order minimizing the influence of the mother tongue, the universality of a natural order for grammatical morphemes in L2 nevertheless appears to be insufficient to explain the development of these grammatical features for some L1 learners of English (e.g., for L1 Spanish, Demarta Dabove, 2014; for L1 Japanese, Nomura, 2012; for L1 Korean, Seog, 2015). For instance, in a recent study, Murakami and Alexopoulou (2016) reported that the accuracy order of grammatical morphemes in the exam scripts of learners from miscellaneous L1 backgrounds (i.e., Spanish, French, Japanese, Russian, Korean, German and Turkish) with different proficiency levels manifested a striking similarity within the same L1 but varied across various L1 backgrounds. As empirical evidence in many studies has suggested (e.g., Haznedar, 2007; Jia & Fuse, 2007; Luk & Shirai, 2009; Nomura, 2012; Seog, 2015), variation in accuracy across different L1s could be linked to the challenge of mastering particular grammatical morphemes for some L1 backgrounds. For example, learners from a *-article* L1, such as Japanese or Turkish, might have difficulty in acquiring a *+article* L2 such as English. Moreover, the dichotomous categorization of languages such as *+/-article* could lead researchers to make overgeneralizations about languages and prevent them from noticing potential differences between languages of the same type, such as Japanese and Turkish. Although Turkish lacks an explicit article system, such as that used in English, it is different from Japanese as well.

More specifically, indefinite articles are not obligatorily marked in Turkish. In addition, while Turkish has an indefinite article which is not always used for genericity, Japanese has no articles at all (Snape et al., 2013).

Keeping all of these points in mind, it is necessary to undertake research focusing on individual languages in order to learn more about the morpheme order in L2 acquisition. Thus, the present study was conducted to identify the accuracy order of the acquisition of grammatical morphemes in L2 English by Turkish learners and to determine whether this order is identical to the natural order (NO) as proposed by Krashen (1977) and subsequently supported by many other researchers (e.g., Mitchell & Myles, 2004; Saville-Troike, 2006). In doing so, we hope to contribute to both SLA research and the sparse literature exploring how Turkish speakers of English employ grammatical morphemes, also taking into account different proficiency levels.

## 2. Literature review

Grammatical morpheme studies are empirical investigations which focus on the acquisition and development of grammatical morphemes by native and non-native speakers. By doing so, they substantiate and support the arguments about the existence of the NO of acquisition followed by L1 and L2 speakers. The groundwork in this field was laid by Brown (1973), who was the first to scrutinize the existence of such an order in L1 learning. This line of inquiry was then expanded through similar studies conducted with L2 learners. The main idea was to determine whether the order of grammatical morphemes remains similar to that of L1 English speakers irrespective of learners' L1 backgrounds. Dulay and Burt (1973), for instance, explored the order of acquisition of eight grammatical morphemes, ranging from the present progressive *-ing* to the auxiliary *be*, among L2 English learners with different L1s. Their assumption was that the order of morpheme mastery would be universal in L2 English as well. Relying on the accuracy with which the grammatical morphemes were used, they found that the acquisition order was similar among L2 learners but it differed to some extent from that originally proposed by Brown (1973) for L1 speakers of English. The findings triggered the idea that there could be a universal order in the acquisition of the English grammatical morphemes by L2 learners.

In line with this view, Krashen (1977) reviewed the related literature on grammatical morpheme acquisition in English by L2 learners and proposed a model which he called the *natural order* by combining and grouping some grammatical morphemes as shown in Figure 1. This model was further elaborated in the work of many other researchers (see Luk & Shirai, 2009). Bailey et al. (1974) explored the natural order of acquisition in adult interlanguage by examining

the use of grammatical morphemes by adult Spanish ( $N = 33$ ) and non-Spanish ( $N = 40$ ) learners of L2 English. The non-Spanish learners were a cohort of participants from eleven L1 backgrounds, such as Afghan, Arabic, Chinese, Greek, Hebrew, Italian, Japanese, Persian, Turkish, Thai and Vietnamese. The data were elicited by means of the *Bilingual Syntax Measure*, which was originally used with children by Burt et al. (1973). The results showed that both the Spanish and the non-Spanish learners followed the same order of acquisition of English grammatical morphemes, which was as follows: (1) progressive *-ing*, (2) copula *be*, (3) plural *-s*, (4) articles, (5) auxiliary *be*, (6) past irregular forms, (7) third person singular *-s*, and (8) possessive *-s*. This order was claimed to be quite similar to the pattern followed by L1 English-speaking children. It was highlighted that the mother tongue does not have a significant effect on the acquisition order for grammatical morphemes. In addition, it was suggested that the effects of classroom learning in the case of adult learners could be improved by following a *natural syllabus*.



Figure 1 Clusters of grammatical morphemes in L2 proposed by Krashen (1977)

This idea has been challenged by various researchers examining data from different L1 backgrounds. For instance, Murakami and Alexopoulou (2016) tested whether the order of acquisition of grammatical morphemes in L2 English is stable or varies depending on the L1 background or proficiency level. One of the aims of their study was to establish whether the lack of a grammatical morpheme in L1 could result in a lower level of accuracy in the TL. Taking into consideration six most commonly studied grammatical morphemes (i.e., articles, past tense *-ed*, plural *-s*, possessive *-s*, progressive *-ing* and third person singular *-s*), they investigated the accuracy of their use in the exam scripts of seven different groups of English L2 speakers (Japanese, Korean, Spanish, Russian, Turkish, German and French) taken from the Cambridge Learner Corpus. They clustered the morphemes within each L1 background and found that they did not seem to be in harmony with the NO hypothesis put forward by Krashen (1977). They also made a range of valuable observations with respect to the order of acquisition of specific morphemes across various L1 groups. As an example, articles appeared to be ranked consistently low in the texts of Japanese, Turkish, Korean and Russian learners of English, whereas the other groups had a higher accuracy rank. Another deviation from the NO concerned the past tense

–*ed* ending, which Korean and Turkish learners used quite consistently in the highest cluster in contrast to those with other L1 backgrounds. This indicates that the mastery of particular morphemes appears to vary depending on the mother tongue of the learner, which casts doubt on the results of Bailey et al. (1974).

Although comparative studies concerned with learners having different L1 backgrounds provide insights into the effect of an L1 on the order of acquisition, focused research investigating the NO of learners with a specific L1 background is required to scrutinize the potential effects of the linguistic features of an L1 on NO in an L2. Recently, such research has investigated the NO in the case of L2 learners of English with such L1s as Spanish (Demarta Dabove, 2014), Korean (Seog, 2015) and Persian (Ghonchepour et al., 2020). However, so far no such study has been carried out with L1 Turkish learners of English to shed light on the factors that might cause deviation from Krashen’s (1977) NO and the findings of empirical investigations conducted in specific contexts.

Table 1 Comparison of three recent L1-specific grammatical morpheme order studies with Krashen’s NO

Krashen’s (1977): NO for L2 acquisition	Demarta Dabove (2014): Spanish EFL learners	Seog (2015): Korean EFL learners	Ghonchepour et al. (2020): Persian EFL learners
Progressive <i>–ing</i>	Articles	Copula <i>be</i>	Regular past <i>–ed</i>
Plural <i>–s</i>	Copula <i>be</i>	Plural <i>–s</i>	Auxiliary <i>be</i>
Copula <i>be</i>	Plural <i>–s</i>	Irregular past	Copula <i>be</i>
Auxiliary <i>be</i>	Progressive <i>–ing</i>	Regular past <i>–ed</i>	Progressive <i>–ing</i>
Articles	Possessive <i>–s</i>	Progressive <i>–ing</i>	Articles
Irregular past	Auxiliary <i>be</i>	Possessive <i>–s</i>	Plural <i>–s</i>
Regular past <i>–ed</i>	Irregular past	Auxiliary <i>be</i>	Possessive <i>–s</i>
3rd person singular <i>–s</i>	Regular past <i>–ed</i>	3rd person singular <i>–s</i>	Irregular past
Possessive <i>–s</i>	3rd person singular <i>–s</i>		3rd person singular <i>–s</i>

*Note.* NO = natural order

Table 1 shows a comparison of the results of studies which have explored grammatical morphemes included in Krashen’s (1977) NO, focusing on specific L1 backgrounds, with the exception of Seog’s (2015) study, in which articles were left out. The order of grammatical morphemes based on their target-like usage (TLU) scores and accuracy orders by L1 Spanish, L1 Korean and L1 Persian speakers of English did not provide full support for the universality of the acquisition of grammatical morphemes. This is also supported by the Spearman rank order correlations performed to see how much the order of morphemes in these studies deviates from that proposed by Krashen (1977). The correlation coefficients were respectively .58 ( $p > .05$ ) between Krashen (1977) and Demarta Dabove (2014); .50 ( $p > .05$ ) between Krashen (1977) and Seog (2015); and .38 ( $p$

> .05) between Krashen (1977) and Ghonchepour et al. (2020), the last of which showed no significant relationships. We also computed Spearman's rank order correlations between the orders of Demarta Dabove (2014) versus Seog (2015) ( $r = 0.64, p > .05$ ); Demarta Dabove (2014) versus Ghonchepour et al. (2020) ( $r = 0.20, p > .05$ ), and Seog versus Ghonchepour ( $r = 0.23, p > .05$ ), but this did not yield any statistically significant correlation, either.

The study by Seog (2015) evidenced that the acquisition order can be violated within the same group, even though the participants shared the L1. Similarly, Demarta Dabove (2014) found that learners at different levels of proficiency follow different patterns regarding accuracy in the use of English grammatical morphemes. Therefore, we attempt to challenge the idea of "a predictable series of benchmarks" (Kwon, 2005, p. 2) by seeking to understand how these morphemes emerge in a particular group of learners from the same L1 background, that is, Turkish. To the best of our knowledge, not much is known about the extent to which L1 Turkish learners produce grammatical morphemes in line with the NO. In view of the lack of research specifically focusing on the acquisition of grammatical morphemes by Turkish EFL learners, the researchers, as L1 Turkish speakers of English, have decided to shed more light on this issue. The current exploratory study therefore focuses on depicting the observed accuracy-based acquisition order of grammatical morphemes of L1 Turkish learners of English, who constitute one of the least represented populations in L2 grammatical morpheme studies. With this purpose in mind, the research project adopted a corpus approach and examined the written TL production of L1 Turkish learners of English. The scarcity of comprehensive studies focusing on the acquisition of grammatical morphemes in English by L1 Turkish learners was the central motivation for the present research, which has the potential to contribute to the existing empirical evidence, also taking into account variable TL proficiency levels.

### 3. The study

In line with the purpose of the study, the acquisition of English grammatical morphemes, which are *copula be*, *progressive -ing*, *auxiliary be*, *plural -s*, *possessive -s*, *3rd person singular -s*, *articles*, *regular past -ed* and *irregular past*, is examined by addressing the following research questions:

1. How accurate are L1 Turkish learners of L2 English in employing these grammatical morphemes in their written production?
2. What is the accuracy order of the acquisition of these grammatical morphemes in the case of L1 Turkish learners of English?
3. To what extent does the identified order align with Krashen's NO for L2 English?

4. Are there any differences in the order when different TL proficiency levels (high/low achievers) are considered?

### 3.1. Corpus

The data set of the present exploratory study came from the exam scripts of freshman students in an English language teaching department at a state university in Turkey, who intended to teach English after their four-year university education. Before entering the department, they were required to take a four-skills proficiency exam developed by the local testing office of the university or achieve at least the B2 level of the CEFR in an internationally accepted exam (such as TOEFL, IBT, PTE Academic). If this condition was not met, they had to study English in the university's preparatory school for at least a year and take the same exams yet again until they could get the required score. On the basis of their level of success in this exam, they can be categorized as upper-intermediate independent users of English at the B2 level. The first version of the corpus of Turkish English Exam Scripts (TEES) was compiled by the present authors in 2019 from written exams in one of the core classes, that is, Advanced Reading and Writing I (available from Akbaş & Ölçü Dinçer, 2021). Each student responded to two timed argumentative writing tasks in two different exams (midterm and final exams) in their first term in the department. The specialized learner corpus included 136 exam scripts, totaling just over 20,000 words. Although the corpus was relatively small, it provided rich data for investigating the observed accuracy level of grammatical morphemes ranging from plural *-s* to past tense regular *-ed*.

### 3.2. Procedures, tools and analysis

The errors made by learners in the use of English grammatical morphemes were investigated to determine the observed accuracy level of participants in exam scripts. In line with Seog (2015), we followed the formula employed by Pica (1983) and calculated target-like use (TLU) for each grammatical morpheme. The formula is as follows:

$$\text{TLU} = \frac{\text{Number of correct suppliance in obligatory contexts}}{\text{Number of obligatory contexts} + \text{Number of suppliance in non-obligatory contexts}}$$

The reason why we opted for TLU was related to our desire to gain a better understanding of interlanguage users' mastery of grammatical morphemes by taking the *underuse*, *misuse* and *overuse* of a given morpheme into account in a non-obligatory context as well. In addition, Pica's formula offers an opportunity

to take into account possible cases of morpheme overuse, which could help to provide a comprehensive picture of the use of grammatical morphemes in context.

In order to investigate the grammatical morpheme accuracy of Turkish speakers of English based on their observed proficiency, we first grouped the exam scripts by taking the grammar proficiency of the same learners into account. To do this, we divided the writers into *high* and *low achievers* depending on their scores in another core class within the program, that is, Advanced Grammar I. Table 2 shows how participants were grouped based on their academic achievement and the quality of the texts within the groups. A cohort of 20 students who got the highest final grades in the Advanced Grammar I module were grouped as *high achievers*. Their final grades in this module ranged from 79 to 91, with a mean of 84. The group of *low achievers* consisted of the 20 students who had the lowest final grades in the grammar class, ranging from 29 to 65, with a mean of 58. Finally, the remaining students ( $N = 28$ ) whose final grades in the grammar class were between 66 and 78, with a mean of 71, constituted *mid achievers*. It should be noted that the scripts of *mid achievers* were only considered in overall calculations but they were excluded from the comparison of high and low proficiency levels.

Table 2 Categorization of participants and details concerning their data

Achievement groups	Number of students	Mean (range) of the exam scores in Advanced Grammar I	Number of texts	Total number of words	Average number of words per text
High	20	84 (79-91)	40	6264	156.6
Mid	28	71 (66-78)	56	8460	151.0
Low	20	58 (29-65)	40	5695	142.3
Total	68	N/A	136	20419	150.1

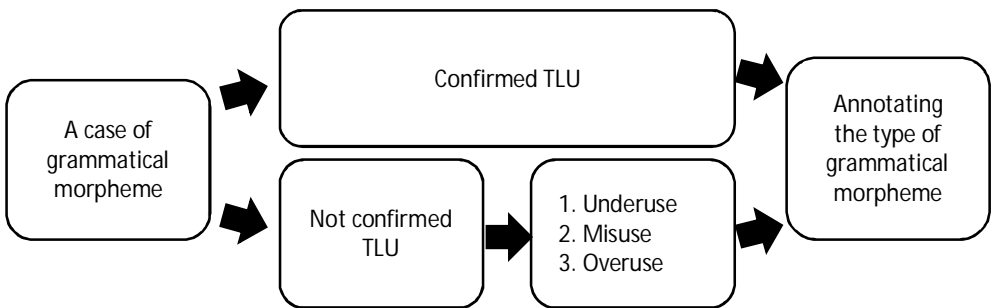


Figure 2 Overview of the annotation scheme

All of the scripts were annotated and analyzed manually by two researchers using UAM Corpus Tool 3.3. Figure 2 shows the annotation scheme employed in the present study with the purpose of calculating the TLU (Pica, 1983) scores for the grammatical morphemes in question. To be more precise, when annotating an



instance of a grammatical morpheme, we followed the same sequence of actions, regardless of whether it represented a target-like use or a non-target-like use (including underuse, misuse and overuse) in obligatory and non-obligatory contexts.

As Figure 2 shows, if a grammatical morpheme was employed correctly, or, to use an alternative label, if it represented a target-like use, only the type of morpheme was annotated. However, when the use of a grammatical morpheme was found to be grammatically incorrect or non-target-like use was detected, the annotators provided an explanation of this case in terms of *underuse*, *misuse* and *overuse* (Pica, 1993) in order to be able to evaluate the concept of suppli-ance in an obligatory context (SOC). If a grammatical morpheme was not used in an obligatory context, the *underuse* of a particular morpheme was selected. When an incorrect form of a grammatical morpheme was supplied in an obliga-tory context, the *misuse* of this morpheme was indicated. The *overuse* of a mor-pheme was selected when the correct form of this morpheme was supplied in a non-obligatory context. It should be pointed out here that the orthographic errors by learners were not considered and they were not counted as non-tar-get-like uses. The three sentences below exemplify the concept of target-like and non-target-like uses as well as annotations with respect to *underuse*, *misuse* and *overuse* in the case of a non-TLU.

- (1) I think, it *is* (?) problematic situation. (M\_MA\_062)<sup>1</sup>

In Example 1, the italicized case of the grammatical morpheme *is* (copula *be*) was coded as a target-like use as it was supplied correctly in an obligatory con-text, whereas there was a non-target-like use of an article since the noun phrase *problematic situation* requires an article (definite or indefinite depending on the context) where the question mark stands. Thus, this case was coded as *underuse* of articles as no obligatory form was supplied in the context.

- (2) It's history comes from *the* very beginning of (?) Industrial Revolution. (M\_LA\_033)

Example 2 provides two target-like and two non-target-like cases. The target-like use forms supplied in obligatory contexts are in italics; they were the third per-son singular *-s* and the definite article *the*. Nevertheless, one of the non-target-like use cases contained a *misuse* of possessive *-s* indicated in bold since the incorrect form was supplied in an obligatory context. In addition, the other non-target-like use concerned *underuse* of the definite article *the*, which was ex-pected to appear before *Industrial Revolution*, indicated by the question mark.

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<sup>1</sup> The codes in parentheses provide information about the position of the extract in the corpus.

- (3) These three main topics shows that how being engaged in work at a young age affects children's whole life. (M\_MA\_058)

Example 3 illustrates three cases of target-like uses (plural *-s*, article, possessive *-s*) in contrast to the non-target-like use of the third person singular *-s* (in bold), annotated as *overuse*. The writer overused the grammatical morpheme in a situation where the correct form was supplied in a non-obligatory context. In general, context was used as a clue to determine the role of grammatical morphemes in ambiguous cases. For example, in order to evaluate the use of a morpheme, as in the case of *brothers* where the inclusion of plural *-s* could be regarded as an *overuse* or target-like use depending on the author's intended meaning, the whole text was taken into consideration to figure out the message and understand the type of use.

Having annotated approximately 30% of the corpus individually by considering the same randomly selected texts and using the same annotation scheme, we discussed our decisions concerning the grammatical morphemes to become familiar with the data coding process and check the consistency of the annotation. Through this initial individual annotation and follow-up discussions, we were able to reflect on our decisions and eliminate the potential effects of disparate coding on the rest of the data. The remaining texts were coded by both researchers, followed by thorough discussions to reach an agreement concerning any specific case. Most of the disagreements were resolved by either asking another researcher or reaching consensus, but in the case of considerable disagreement and ambiguity concerning a grammatical morpheme, that particular case was simply excluded from the analysis. By using an iterative annotation procedure, we attempted to ensure the reliability of our coding process for any grammatical morpheme.

#### 4. Results

The manual analysis of the corpus yielded a total of 2,883 cases of grammatical morphemes and a range of results concerning their target-like and non-target-like uses. Table 3 summarizes the overall results in regard to each grammatical morpheme under investigation. A macro-average was used to compute the overall performance of the participants, which yielded an average TLU score of 0.85. Predictably, the accuracy level differed across the morphemes. 2,440 out of the 2,883 cases of grammatical morphemes represented target-like use (84.6% accuracy), and almost 15% of the cases ( $N = 443$ ) turned out to represent non-target-like use. Interestingly, we found either an overwhelming *underuse* or *overuse* in all the non-target-like instances of a given morpheme. To be more specific, the participants omitted a grammatical morpheme which should appear in an obligatory context ( $N = 185$ , 41% of all non-target-like uses) or provided a grammatical morpheme in a non-obligatory context ( $N = 190$ , 43% of all non-target-like uses).

Table 3 Target-like uses and non-target-like uses of grammatical morphemes in the corpus

Grammatical morphemes	Obligatory & non-obligatory cases	Target-like uses			Non-target-like uses			TLU	
		Underuse			Misuse		Overuse		
		f	f	%	f	%	f		%
1. Present progressive <i>-ing</i>	21	19	0	0.0	0	0.0	2	9.5	0.90
2. Plural <i>-s</i>	993	859	79	8.0	11	1.1	44	4.4	0.87
3. Irregular past	73	55	2	2.7	2	2.7	14	19.2	0.75
4. Possessive <i>-s</i>	70	59	7	10.0	2	2.9	2	2.9	0.84
5. Copula <i>be</i>	400	367	11	2.8	15	3.8	7	1.8	0.92
6. Articles	874	692	63	7.2	21	2.4	98	11.2	0.79
7. Regular past <i>-ed</i>	62	50	8	1.9	0	0.0	4	6.5	0.80
8. Third person singular <i>-s</i>	148	120	10	6.8	5	3.4	13	8.8	0.81
9. Auxiliary <i>be</i>	242	219	5	2.1	12	5.0	6	2.5	0.90
Total	2883	2440	185	6.4	68	2.4	190	6.9	
							443		0.85

Note. TLU = target-like use

Since the learners were free to respond to essay questions in any way they wished and they were not encouraged to supply particular types of grammatical morphemes, the number of cases for each morpheme emerged naturally and we were only interested in the number and type of correctly and incorrectly supplied grammatical forms. As can be seen in Table 3, the copula *be* had the highest level of accuracy (TLU: 0.92), whereas the participants supplied irregular past forms the least correctly (TLU: 0.75). The grammatical morphemes of the present progressive *-ing* (TLU: 0.90), plural *-s* (TLU: 0.87) and possessive *-s* (TLU: 0.84) were used with greater accuracy. What may potentially explain these findings is the fact that very similar morphemes exist in Turkish (*-Iyor* for marking progression in time, *-IAr* for plural marking and *-In* for denoting possession), which could increase the likelihood of producing the correct form of corresponding grammatical morphemes in English. As shown by Luk and Shirai (2009), L1 could have a pivotal influence on the acquisition of a particular grammatical morpheme in the L2 in the case of an absence or presence of an L1 equivalent. This assumption also finds support in the lower accuracy level of third person *-s*, which does not exist or have a close equivalent in Turkish (Hamamcı & Hamamcı, 2018). Similarly, non-existence of an explicit article system in Turkish can account for the relatively less accurate use of articles (TLU: 0.79), which was evident in the fact that more than one in five occurrences of an article represented a non-target-like use. This said, compared with the findings of Nomura (2012), who found that Japanese learners of English with no article system in their L1 displayed a tendency to *underuse* articles, Turkish learners were found to *overuse* them, with cases of such overuse exceeding instances of underuse and misuse combined.

Table 4 Accuracy of using grammatical morphemes among high and low achievers

Grammatical morphemes	High achievers			Low achievers			High vs. low achievers	
	Target-like use	Non-target-like use	TLU	Target-like use	Non-target-like use	TLU	$\chi^2$	$p$
1. Present progressive <i>-ing</i>	8	0	1.00	2	2	0.50	4.80*	0.03
2. Plural <i>-s</i>	298	24	0.93	193	47	0.80	18.30*	0.01
3. Irregular past	19	2	0.90	16	7	0.70	2.95	0.09
4. Possessive <i>-s</i>	14	2	0.88	17	5	0.77	0.64	0.42
5. Copula <i>be</i>	105	4	0.96	110	8	0.93	1.09	0.30
6. Articles	208	57	0.78	187	45	0.81	0.34	0.56
7. Regular past <i>-ed</i>	19	1	0.95	23	7	0.77	3.00	0.08
8. Third person singular <i>-s</i>	36	10	0.78	19	7	0.73	0.24	0.61
9. Auxiliary <i>be</i>	76	3	0.96	58	10	0.85	5.39*	0.02
Total	783	103	0.88	625	138	0.82	13.70*	0.01

Note. \* $p < .05$

In view of the complexity of the acquisition and processing of L2 morphemes (Larsen-Freeman, 2010), we also set out to determine whether learners with higher proficiency in L2 grammar achieved better TLU scores compared to those with lower proficiency. In order to do so, we compared high and low achievers with respect to instances of accurately and inaccurately used grammatical morphemes in the texts they produced. As can be seen in Table 4, proficiency level surely played a role in the overall success in processing and using the grammatical morphemes under investigation. The high achievers in L2 grammar produced those morphemes with almost 90% accuracy (TLU: 0.88). In contrast, the low achievers used the grammatical morphemes less correctly, with the TLU score of 0.82. A *chi*-square test showed that the difference was statistically significant ( $\chi^2 = 13.70$ ,  $p < .05$ ). Both groups were able to supply copula forms correctly to a considerable extent, which was also the morpheme that was used with highest accuracy across the corpus. Apart from the gap between high and low achievers with respect to present progressive *-ing*, there was an observable discrepancy between the two groups in the use of irregular past forms (TLU: 0.90 vs. 0.70) and regular past *-ed* (TLU: 0.95 vs. 0.77). However, the results of chi-square tests showed that the differences were not statistically significant in either case ( $\chi^2 = 2.95$ ,  $p > .05$  for irregular past forms and  $\chi^2 = 3.00$ ,  $p > .05$  for regular past *-ed*).

In this study, we relied on TLU scores for grammatical morphemes under investigation and ranked them accordingly. In doing so, we were able to observe instances where the accuracy order in our data deviated from the NO proposed by Krashen (1977). As shown in Table 5, this was particularly true about forms having equivalents in Turkish such as possessive *-s* since these forms manifested a relatively higher rank. Although there is considerable support for the universality of the order of acquisition of English grammatical morphemes in the literature

(e.g., Saville-Troike, 2006), our findings suggest that, on the whole, the accuracy orders of Turkish learners of English do not closely match the NO suggested by Krashen (1977). However, when we calculated Spearman's rank correlations, we found a positive, statistically significant correlation between the order proposed by Krashen and that of high achievers ( $r = .72, p < .05$ ). This could suggest that the similarity of the morpheme acquisition order in L2 and the proposed universal order might be related to learners' proficiency level.

Table 5 Accuracy order of grammatical morphemes and comparison with Krashen (1977)

Krashen (1977)	Current study			
	Overall	TLU High achievers	TLU Low achievers	TLU
Progressive <i>-ing</i>	Copula <i>be</i>	0.92 Progressive <i>-ing</i>	1.00 Copula <i>be</i>	0.93
Plural <i>-s</i>	Progressive <i>-ing</i>	0.90 Copula <i>be</i>	0.96 Auxiliary <i>be</i>	0.85
Copula <i>be</i>	Auxiliary <i>be</i>	0.90 Auxiliary <i>be</i>	0.96 Articles	0.81
Auxiliary <i>be</i>	Plural <i>-s</i>	0.87 Regular past <i>-ed</i>	0.95 Plural <i>-s</i>	0.80
Articles	Possessive <i>-s</i>	0.84 Plural <i>-s</i>	0.93 Possessive <i>-s</i>	0.77
Irregular past	3rd person singular <i>-s</i>	0.81 Irregular past	0.90 Regular past <i>-ed</i>	0.77
Regular past <i>-ed</i>	Regular past <i>-ed</i>	0.80 Possessive <i>-s</i>	0.88 3rd person singular <i>-s</i>	0.73
3rd person singular <i>-s</i>	Articles	0.79 Articles	0.78 Irregular past	0.70
Possessive <i>-s</i>	Irregular past	0.75 3rd person singular <i>-s</i>	0.78 Progressive <i>-ing</i>	0.50
Spearman's rank correlation	Krashen (1977) vs. overall	Krashen (1977) vs. high achievers	Krashen (1977) vs. low achievers	
	$r = .60, p > .05$	$r = .72^*, p < .05$	$r = .15, p > .05$	

Note. \* $p < .05$

With respect to the accuracy order presented in Table 5, it is clear that the overall order of grammatical morphemes in the present research aligns to some extent with Krashen's (1977) NO. The similarities are as follows:

- copula *be* and progressive *-ing* ranked high in the TEES corpus and Krashen (1977);
- auxiliary *be* was proximately placed after copula *be*, indicating similar development in L2 use for these free-standing morphemes; the accuracy rates for copula *be* and auxiliary *be* were similar in the corpus, thus mirroring Krashen's (1977) NO.
- compared with other morphemes, irregular past, regular past *-ed* and third person singular *-s* were placed relatively late in the order both in Krashen's (1977) proposal and in the TEES corpus.

On the other hand, the analysis revealed some differences between the orders of acquisition in the present study and the widely-held view that L2 learners are driven by "internal principles that are largely independent of their first language" (Mitchell & Myles, 2004, p. 43), resulting in the NO for L2 English learners. The most important deviations are the following:

- in contrast to Krashen (1977) and the findings of Murakami (2013) and Murakami and Alexopoulou (2016) for L1 Turkish, possessive *-s* was ranked relatively high in the TEES corpus;
- while, according to Krashen (1977), irregular past forms are acquired before the regular past tense marker *-ed*, the analysis of the TEES revealed exactly the opposite accuracy order for Turkish learners of English, irrespective of their L2 grammar proficiency.

In addition to showing the accuracy order of grammatical morphemes in our corpus with respect to deviations from the NO, the data in Table 5 also illustrate the effect of proficiency level. In particular, we found that greater mastery of L2 grammar translates into more accurate use of almost all the morphemes, with the exception of articles. Specifically, all morphemes serving as tense and aspect markers, such as regular past *-ed*, third person singular *-s*, irregular past forms and progressive *-ing*, ranked lower for low achievers, whereas only third person singular *-s* was placed lower in the order for high achievers (although it still represented higher TLU compared with low achievers). The hierarchy of plural *-s*, possessive *-s* and third person singular *-s* remained the same across the corpus of Turkish participants despite variations in the correct use of these three morphemes.

## 5. Discussion

The purpose of this study was to investigate the extent of accuracy in supplying grammatical morphemes in a written corpus of L1 Turkish learners of L2 English. With respect to the first research question, we found on the basis of data from the TEES corpus that Turkish speakers of English used grammatical morphemes with an average TLU score of 0.85 (see Table 3). In order to answer the other research questions, we first checked whether the order of grammatical morphemes aligned with the acquisition order suggested by Krashen (1977). Further analyses compared the accuracy-based orders of these morphemes for high and low achievers. In line with Murakami (2013), who demonstrated that learners from different L1 backgrounds might follow different accuracy orders for English grammatical morphemes, we revealed that Turkish learners of English also took a different path which did not mirror the acquisition order that was proposed by Krashen (1977) and later accepted by other specialists (e.g., Ortega, 2009; Saville-Troike, 2006). Thus, the findings of the present study support the results of previous research (e.g., Izumi & Isahara, 2004; Luk & Shirai, 2009; Murakami, 2013; Murakami & Alexopoulou, 2016) and provide further evidence against the universality of the acquisition order of English grammatical morphemes.

Murakami and Alexopoulou (2016) proposed that the grammatical morphemes which exist in L1 are likely to be used accurately by English learners compared with those which do not. The overall findings of the present study corroborate this argument. To be more specific, the overall accuracy in the use of copula *be*, present progressive *-ing*, auxiliary *be*, plural *-s* and possessive *-s* manifested by Turkish learners in their exam scripts can be explained by the existence of these structures in Turkish. In contrast, third person *-s*, articles and irregular past are not explicitly present in Turkish, with the effect that these morphemes were ordered after the first group comprising morphemes which do exist in Turkish.

Although Turkish does inflect verbs to mark the past tense by using *-di*, surprisingly, the past tense *-ed* morpheme was one of the least accurately supplied morphemes, especially by low achievers (see Table 5). This could be partly attributed to the completely different system for marking past tense meaning in English. Figure 3 shows the predictability and variation of the simple past tense (affirmative only) for Turkish speakers of English to show how difficult it is for them to adapt to the L2 norms and supply correct forms. Figure 3 clearly demonstrates the dichotomous choice between deciding whether the verb is regular or irregular in order to process its conjugation in the English simple past tense. It should also be mentioned that while many of the irregular past tense markers in English cluster into prototypes (cf. Bybee & Slobin, 1982) and thus have a kind of predictable form, they may still be a source of difficulty for Turkish learners whose L1 does not include irregular past markers. The whole system for providing simple past meaning in Turkish is based on the grammatical morpheme *-d(i,ı,u,ü)* and therefore it is a considerable challenge for Turkish learners to acquire the whole system in English. It is warranted to assume that things might get even more intricate when negative and interrogative forms in the simple past tense are considered (see Example 4 below). The following cases from high and low achievers illustrate the non-target-like use of regular and irregular past forms in their texts.

- (4) So in my opinion underaged children who *didn't completed* mental and physical development should NOT work and should be allowed to enjoy with their childhood. (M\_LA\_005)
- (5) After mankind *settle* up the factories, they needed small and agile hands for their machines to operate. (M\_LA\_033)
- (6) To illustrate that, people *said* that a broken mirror may bring bad luck; it is said that house where mirror was broken cannot get well for a period of seven years. (F\_HA\_007)

Examples 4 and 6 clearly reflect an *overuse* of regular past *-ed* and the irregular past form in which the learners supplied extra functors in a non-obligatory context. Example 5 shows a case of an *underuse* of the regular past *-ed* morpheme which is supposed to be present in this obligatory context. Taking this into account and interpreting the results for regular and irregular past morphemes, it is

possible to shed light on why they are the two least accurately produced grammatical morphemes.

Interestingly, however, with the help of Figure 3 it is also possible to interpret the difference between the observed accuracy order of regular past *-ed* and irregular past forms in our study and in some other studies (e.g., Demarta Dabove, 2014; Seog, 2015). In Krashen (1977) as well the order of acquisition with irregular past tense forms first and the regular past *-ed* form next is included among the less clear cases (p. 148). With respect to the results of regular and irregular past morphemes, past tense *-ed* preceded irregular past forms in our corpus. This difference might be explained by the similarity in the inflections of the Turkish past tense *-di* and past tense *-ed* in English. This could therefore provide evidence for the effect of learners' L1 on the observed accuracy orders (Luk & Shirai, 2009). In addition, according to the markedness differential hypothesis (Eckman, 1977), while unmarked language components of L1s are more likely to be transferred to L2s, marked features of L2s can be expected to be harder to learn. Thus, compared to its unmarked counterpart past tense *-ed*, the marked irregular past form could be acquired by L1 Turkish learners at a later time.

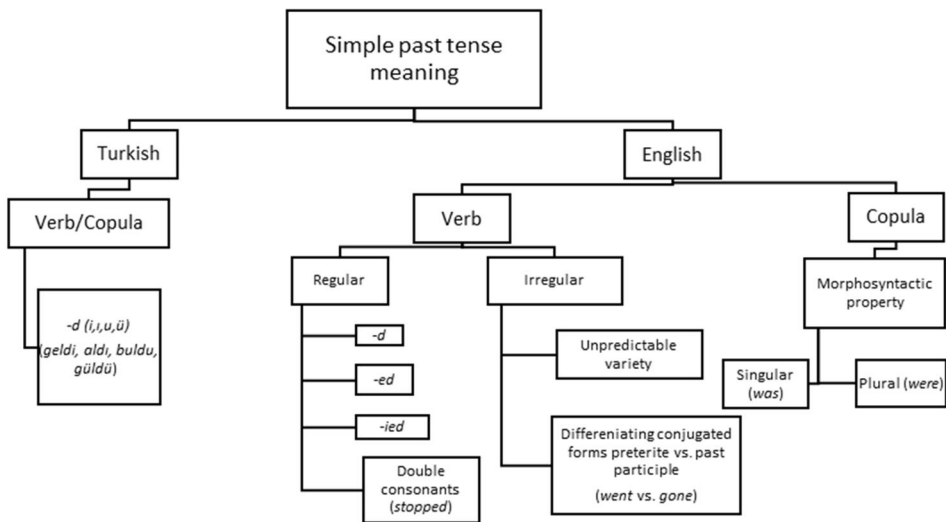


Figure 3 Comparison of predictability and variation of the forms of the simple past tense in Turkish and English

When it comes to the hierarchy of plural *-s*, possessive *-s* and third person singular *-s*, the same order appears to have been observed in some of the previous studies (Demarta Dabove, 2014; Ghonchepour et al., 2020; Seog, 2015), on the basis of which an argument could be made for the universality of the order of accuracy of grammatical morphemes at the micro level. Similarly to the



proposal made by Krashen (1977) for L2 English, we also found that third person singular *-s* tended to represent a considerable difficulty for Turkish speakers of English, which translated into low accuracy levels (in fact, this was the least accurately used morpheme) and is in line with the observations of Murakami and Alexopoulou (2016) for L1 Turkish. Slobin (1996) proposes that form-related features such as articles or progressive *-ing* are susceptible to L1 influence, while semantic features such as plurality are less likely to be affected by the mother tongue. The observed order of acquisition of plural *-s*, followed by possessive *-s*, followed by third person singular *-s* could be accounted for in terms of Slobin's (1996) claim in the sense that the form-related third person singular *-s* was placed later in the order than the forms with semantic features such as plural *-s* and possessive *-s*. Another possible explanation can be based on the cross-linguistic comparisons of Turkish and English. When grammatical morphemes do not have an equivalent form in Turkish (third person singular *-s*, articles, irregular past), they seem to rank rather low. On the other hand, the ones with equivalent forms (e.g., possessive *-s* in English and Turkish possessive suffix *-In'*; plural *-s* in English and *-Ar* in Turkish) are located relatively high in the order established on the basis of the TEES data.

This study also contributes to discussion of the acquisition of grammatical morphemes in a set order by comparing the observed accuracy order of learners with different proficiency levels in L2 grammar. When the cases produced by high- and low-proficiency learners were taken into consideration, it turned out that the accuracy patterns of the two cohorts deviated from each other. Moreover, Spearman's rank correlation tests indicated that the rank order of the higher-proficiency group was more similar to Krashen's (1977) proposed order than that of the lower-proficiency participants. This may indicate that interlanguage characteristics of lower-proficiency learners are different from those with a high proficiency. All in all, findings of this kind cast further doubt on the existence of the universal order showing that such patterns might differ as a function of both L1 background and TL proficiency.

Specifically, the rank of articles in the two proficiency groups deserves special attention. Accuracy of article use in the low-proficiency group was third in order, whereas it was one of the last morphemes in the accuracy order observed for the high-proficiency group. In addition, low achievers' TLU score for articles (TLU: 0.81) was slightly higher than that of high achievers (TLU: 0.78). Interestingly, such a situation was the case only with respect to this particular morpheme; all other grammatical morphemes used by high achievers tended to have higher TLU scores than those used by low achievers. This deviance is probably due to the fact that Turkish lacks an explicit article system such as that used in English. In fact, such an interpretation finds support in Snape et al. (2013),

who found that L1 Turkish learners have problems with the use of definite articles even at advanced levels. Thus, even for high-proficiency learners, more attention and practice might be needed to master this feature. The lack of an explicit article system in Turkish could account for relatively low accuracy in article use in the two groups of learners with different proficiency levels. In other words, in line with Murakami (2013), grammatical morphemes which do not exist in L1 could pose a considerable difficulty for L2 learners.

In his often cited paper, Krashen (1977) mentions the potential effects of an L1 on the order of grammatical morphemes in L2 learning. However, he claims that if an L1 has an impact on the order of morphemes, this is “an indication of low acquisition” and “un-natural” (p. 156). Recent studies, however, such as those by Luk and Shirai (2009) or Murakami and Alexopoulou (2016) have reported findings that support the role of an L1 in the morpheme order studies. This indicates that cross-linguistic comparisons of an L1 and L2 can offer interesting insights into the order of acquisition of grammatical morphemes in L2. However, differences between L1 and L2 should not be limited to the *+/-linguistic feature* dichotomy but rather be carefully conceived to tease out the details which might affect the overall explanations for interlanguage processes. For example, both Japanese and Turkish are considered to be *-article* languages. However, the explanation for the article acquisition of an L1 Turkish learner could be different from an L1 Japanese learner in the sense that the former operates with a kind of indefinite article, while the latter does not have any grammatical form that would resemble articles (Snape et al., 2013) in their L1. Therefore, we need language-specific studies, such as the present investigation focusing on L1 Turkish learners, to gain a deeper understanding of such issues.

## 6. Conclusion

Before offering concluding remarks, we first need to state that we do not take the concept of acquisition in the narrow sense (naturalistic, largely implicit learning); instead, we consider instructed explicit EFL learning as a type of L2 acquisition as well. The universality of a natural order in the acquisition of grammatical morphemes has been challenged by recent research in the field of SLA. Data from learners with different L1 backgrounds have indicated that there might be an influence of L1 on the acquisition of English grammatical morphemes in the sense that when the morphemes do not exist in L1, they are likely to be acquired at a later time. The analysis of written production of L1 Turkish learners of English in the TEES corpus can serve as a basis for contradicting the arguments about the existence of a natural order for grammatical morphemes and support claims about the influence of L1 on this process. We observed that

the article system, which does not exist in Turkish, is placed towards the end of the ranking based on the observed accuracy order. In addition, our results indicate that not only the L1 but also overall grammatical proficiency may have an effect on the accuracy order of grammatical morphemes. An interesting finding is that high achievers overall gained higher TLU scores than low achievers except for articles. This deviation could be interpreted as a consequence of the L1 influence in the case of Turkish speakers of English in that structures which are present in learners' L1 continue to pose a difficulty even at more advanced levels.

Although the existence of a fixed pattern for the acquisition of grammatical morphemes has been refuted by recent research as well as by our findings to some extent, it is clear that some clear patterns exist at the micro level. It was pointed out by Luk and Shirai (2009) that, rather than a universal order, there could be some universal features across L2 speakers of English in terms of grammatical morpheme acquisition. In fact, this study corroborated some the results of previous research (e.g., Demarta Dabove, 2014; Krashen, 1977; Seog, 2015): (a) copula *be* always precedes auxiliary *be* in the accuracy order, (b) regular past *-ed* and irregular past forms are located proximately, and (c) plural *-s* always precedes third person singular *-s* and possessive *-s* in the order. On the basis of these observations, we propose the universality of morphemes at the micro level. Further research could therefore take a micro-level perspective on morpheme order, which might further our understanding of how grammatical morpheme acquisition in L2 English occurs. However, it should be kept in mind that it may not be easy to explicate the complex nature of the acquisition of morphemes in some cases since, as pointed out by Larsen-Freeman (2010), along with learners' L1 background and proficiency levels, there are also some other factors to consider, such as frequency and quality of TL input, which depend on the characteristics of linguistic environment, as well as the impact of individual differences.

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